APRIL/MAY 2023

DEPH34B — MATERIAL SCIENCE

Time : Three hours

Maximum : 75 marks

LIBRARY

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. State Gibbs phase rule.

2. Give examples for peritectic reaction.

3. How does polymer get deformed?

4. What are ceramics?

5. Write a short note on degradation of biomaterials.

6. Write any two applications of biomaterials for biomedical applications.

7. What do you mean by nonlinear optics (NLO)?

8. Define optical mixing.

9. What is meant by P.N. Junction?

10. Distinguish between lead acid and nickel cadmium batteries.

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SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Illustrate the concept of iron-iron carbide phase diagram.

Or

(b) Describe the development of microstructure in isomorphous alloys.

12. (a) Illustrate the stress — strain behavior of ceramics.

Or

(b) Write a note on polymer structures.

13. (a) Discuss the various properties of biomaterials.

Or

(b) Illustrate the role of biomaterials in imaging.

14. (a) Write a note on phase matching.

Or

(b) Discuss the concept of third harmonic generation.

15. (a) How the supercapacitors can be used in energy storage?

Or

(b) Discuss the role of carbon nano materials as electrodes in batteries.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain in detail about Binary phase diagrams.

17. Describe in detail about the different types of ceramics.

18. Describe in detail about the preparation of polymeric biomaterials.

19. Explain in detail about the second harmonic generation.

20. Explain in detail about dye sensitized solar cells.
